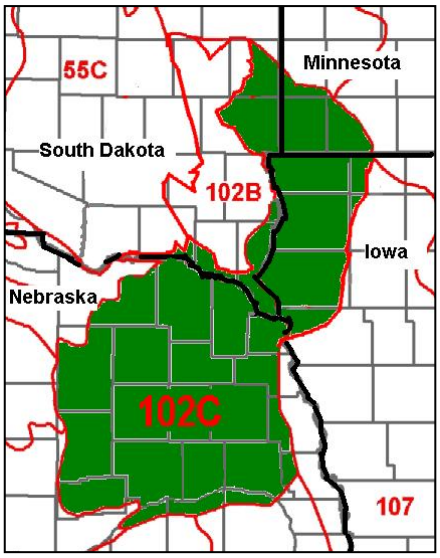
FORAGE SUITABILITY GROUP (FSG)
Subirrigated

FSG No.: G102CY700NE

Major Land Resource Area (MLRA): 102C - Loess Uplands



Physiographic Features

Most of the soils in this group are found on level and nearly level flood plains and terraces. Some also occur in interdunal swales and valleys of sandhills.

	Minimum	Maximum
Elevation (feet):	980	1640
Slope (percent):	0	3
Flooding:		
Frequency:	None	Frequent
Duration:	None	Long
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Very low	Medium

Climatic Features

Annual precipitation varies widely from year to year in MLRA 102C. Average annual precipitation for all climate stations listed below is about 27 inches. About 73 percent of the annual precipitation occurs during the months of April through September. On average, there are about 33 days with greater than .1 inches of precipitation during the same time period. Annual precipitation and temperature increase from the northwest to the southeast in the MLRA. Precipitation is less than needed for optimum forage production and is the single largest factor limiting production from this group on non-irrigated lands.

Average annual snowfall ranges from 19 inches at Creighton, to 36 inches at Wakefield. Days with snow cover at depths greater than 1 inch range from 9 days at Creighton to 55 days at Wakefield.

Average July temperatures are about 76°F and average January temperatures are about 20°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -36 at Creighton and a high of 108 recorded at both Columbus and Wakefield. The MLRA lies mostly in USDA Plant Hardiness Zone 4b with some small areas of warmer 5a.

At Norfolk, Nebraska (NE), the average annual wind speeds are about 11.2 MPH. The highest wind speeds occur during March and April. It is cloudy about 146 days a year. Average morning relative humidity in June is about 82 percent, and average afternoon humidity is 55 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at http://www.wcc.nrcs.usda.gov.

	From	To
Freeze-free period (28 deg) (days):	138	168
(9 years in 10 at least)		
Last Killing Freeze in Spring (28 deg):	May 12	Apr 25
(1 year in 10 later than)		
Last Frost in Spring (32 deg):	May 20	May 10
(1 year in 10 later than)		

	From	To
First Frost in Fall (32 deg): **(1 year in 10 earlier than)**	Sep 12	Sep 23
First Killing Freeze in Fall (28 deg): **(1 year in 10 earlier than)**	Sep 20	Oct 04
Length of Growing Season (32 deg) (days): **(9 years in 10 at least)**	126	146
Growing Degree Days (40 deg):	4833	5730
Growing Degree Days (50 deg):	2815	3551
Annual Minimum Temperature:	-25	-15
Mean annual precipitation (inches):	23	30

Monthly precipitation (inches) and temperature (F):

2 years in 10:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip. Less Than	0.15	0.17	0.51	0.83	1.92	1.98	1.71	1.35	1.07	0.44	0.15	0.30
Precip. More Than	1.13	1.20	3.39	3.93	5.93	6.63	4.33	5.39	5.53	3.85	2.16	1.47
Monthly Average:	0.55	0.76	2.04	2.53	4.03	4.20	3.09	3.03	3.00	2.02	1.18	0.86
Temp. Min.	5.3	10.6	23.0	35.4	46.5	56.8	61.9	58.7	48.4	35.6	23.8	10.7
Temp. Max.	32.4	38.2	50.2	65.2	75.6	84.8	88.7	86.1	77.7	66.5	49.7	35.3
Temp. Avg.	19.7	25.3	36.8	50.6	61.6	71.3	75.9	73.1	63.9	52.3	37.1	23.5

Climate Station	Location	From	To
NE1825	Columbus, NE	1961	1990
NE1990	Creighton, NE	1961	1990
NE3050	Fremont, NE	1961	1990
NE6018	NE Nebraska Experiment	1964	1990
NE8110	Stanton, NE	1961	1990
NE8480	Tekamah, NE	1961	1990
NE8915	Wakefield, NE	1961	1990
NE8935	Walthill, NE	1961	1990

Soil Interpretations

The soils in this group are mostly somewhat poorly drained. They have a seasonal water table within 18 to 48 inches of the surface during part of the growing season.

Drainage Class:	Poorly drained	To	Moderately well drained
Permeability Class: **(0 - 40 inches)**	Slow	To	Rapid
Frost Action Class:	Moderate	To	High

	Minimum	Maximum
Depth:	60	
Surface Fragments >3" (% Cover):		
Organic Matter (percent): **(surface layer)**	0.5	6.0
Electrical Conductivity (mmhos/cm): **(0 - 24 inches)**	0	4
Sodium Absorption Ratio: **(0 - 12 inches)**	0	10
Soil Reaction (1:1) Water (pH): **(0 - 12 inches)**	5.6	8.4
Available Water Capacity (inches): **(0 - 60 inches)**	3	
Calcium Carbonate Equivalent (percent): **(0 - 12 inches)**	0	25

Soil Component List (some phases of these soils may also occur in other FSG's)

Benclare	Storla	Elsmere	Ord variant
Chancellor	Wakonda	Gibbon	Orwet
Chaska	Waubonsie	Kezan	Ovina
Crossplain	Whitewood	Lawet	Percival
Davison	Alda	Leshara	Platte
Dimo	Blake	Libory	Shell
Lakeport	Blencoe	Mcpaul	Shell variant
Lamo	Boel	Modale	Wann
Lex	Clamo	Nodaway	
Meckling	Coleridge	Onawa	
	Els	Ord	

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at http://plants.usda.gov.

Cool Season Grasses	**Symbol**		**Warm Season Grasses**		
Canada wildrye	ELCA4	F	Big bluestem	ANGE	G
Creeping foxtail	ALAR	F	Indiangrass	SONU2	G
Intermediate wheatgrass	THIN6	G	Little bluestem	SCSC	F
Meadow bromegrass	BRBI2	G	Switchgrass	PAVIV	G
Orchardgrass	DAGL	G	**Legumes**	**Symbol**	
Pubescent wheatgrass	THIN6	G	Alfalfa	MESA	F
Reed canarygrass	PHAR3	G	Alsike clover	TRHY	G
Smooth bromegrass	BRINI2	G	Birdsfoot trefoil	LOCO6	G
Tall fescue	LOAR10	G	Canada milkvetch	ASCAC6	F
Tall wheatgrass	THPO7	G	Cicer milkvetch	ASCI4	F
Virginia wildrye	ELVI3	F	Purple prairieclover	DAPUP	F
Western wheatgrass	PASM	F	Red clover	TRPR2	G
			White prairieclover	DACAC	F

G - Good adaptation for forage production on this group of soils in this MLRA
F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. Seventy percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop	Dryland Management Intensity Low (lbs/ac)	High (lbs/ac)
Alfalfa	6600	14300
Alfalfa/Intermediate wheatgrass	5700	12900
Alfalfa/Orchardgrass	5700	12900
Alfalfa/Smooth bromegrass	5700	12900
Big bluestem	5100	12900
Creeping foxtail	4300	9100
Intermediate wheatgrass	4300	10000
Orchardgrass	4300	9100
Reed canarygrass	5700	11400
Smooth bromegrass	4300	9100
Switchgrass	5100	12000

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: SD0001
Growth Curve Name: Alfalfa
Growth Curve Description: Alfalfa, MLRA's 102B, 102C, 63B, 66, 65

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	30	25	20	15	5	0	0	0

Growth Curve Number: SD0004
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass, statewide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	40	30	10	5	5	0	0	0

Growth Curve Number: SD0005
Growth Curve Name: Warm season grass
Growth Curve Description: Warm season grass, statewide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	35	15	0	0	0	0

Growth Curve Number: SD0003
Growth Curve Name: Irrigated Alfalfa
Growth Curve Description: Irrigated Alfalfa, statewide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	25	25	20	15	10	0	0	0

Soil Limitations

These soils have few limitations to the production of climatically adapted forage crops, and production potential is high. Forage species like alfalfa that are less tolerant of saturated soils for extended periods of time may suffer stand loss during wet years when watertables stay abnormally high. These soils are also subject to compaction if grazed or machinery operated on them when wet. Coarser textured soils in this group may be subject to soil blowing when establishing new stands.

Management Interpretations

When establishing new stands select species that are tolerant of somewhat poorly drained, occasionally saturated soils, and that are also capable of utilizing the additional moisture inherent to these soils. Excluding livestock

and machinery during extended periods of soil wetness will help reduce soil compaction. On coarser textured soils, incorporate wind erosion control practices during stand establishment.

FSG Documentation

Similar FSG's:

FSG ID	FSG Narrative
G102CY500NE	Overflow soils do not have water tables within 18-48 inches of the surface during part of the growing season.
G895CY295NE	Saline/Sodic - Wet soils have restrictive levels of salinity.

Inventory Data References:

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone maps
National Soil Survey Information System for soil surveys in Nebraska and South Dakota counties in MLRA 102C
NRCS Nebraska Field Office Technical Guide and South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation:

This site has been correlated with the following states: Nebraska and South Dakota

Forage Suitability Group Approval:

Original Author:	Tim Nordquist
Original Date:	6/8/2001
Approval by:	Dave Schmidt
Approval Date:	1/13/05